

REMARKS

Claims 1 to 18 are all the claims pending in the application, prior to the present amendment.

Claims 1, 3, and 5-18 have been rejected under the first paragraph of 35 U.S.C. § 112 as failing to comply with the written description requirement.

The Examiner states that the claims contain subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

In particular, the Examiner states that the originally filed specification does not provide support for the full scope of the newly recited phrase “subjecting the resultant mixture to annealing at a temperature of from 55°C higher than the glass transition point of the resin to a temperature 75°C higher than the glass transition point of the resin.”

The Examiner states that applicants have argued that Example 1 provides support for this recitation. The Examiner states that Example 1 only contains three single points as support for this recitation. The Examiner states that these single points do not show that the inventors had possession of the full scope of the newly recited annealing temperature range, at the time of the invention, for all resins encompassed, for all ingredient amounts encompassed, and for all ingredient combinations encompassed by the newly recited claim scope.

The Examiner states that it is not seen that applicants had possession of the full scope of the presently claimed invention at the time of the invention, and that the newly recited matter is new matter.

In response, applicants disagree with the Examiner's conclusion that the specification does not provide support for the presently amended claims.

The present specification, as originally filed, broadly discloses the concept of subjecting the mixture "to annealing at a temperature equal to or higher than the glass transition point of the resin." See page 8, lines 10-15 and original claim 14. Thus, the broad scope of the original disclosure encompassed all resins, all ingredient amounts and the entire annealing temperature range of a temperature equal to or higher than the glass transition point of the resin.

The present temperature range now recites a narrower range that is within the scope of the original range and which is based on values disclosed in an Example of the present specification.

Applicants submit that the recited temperature range finds support in the specification in accordance with the decision in *In re Wertheim*, 191 USPQ 90, 98 (CCPA 1976)). In *Wertheim*, the original specification described a broad range of "25%-60%" and specific examples of "36%" and "50%." In *Wertheim*, the applicants amended the claims to recite a narrower range that was within the described broad range based on the specific example of 36%. According to the *Wertheim* court, a corresponding new claim limitation to "between 35% and 60%" met the description requirement because persons skilled in the art would consider employing a 35-60% solids content range as part of appellants' invention.

As the court stated in *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976):

That what . . . [applicants] claim as patentable to them is less than what they describe as their invention is not conclusive if their specification also reasonably

describes that which they do claim. Inventions are constantly made which turn out not to be patentable, and applicants frequently discover during the course of prosecution that only a part of what they invented and originally claimed is patentable. As we said in a different context in *In re Saunders*, 58 CCPA 1316, 1327, 444 F.2d 599, 607, 170 USPQ 213, 220 (1971):

To rule otherwise would let form triumph over substance, substantially eliminating the right of an applicant to retreat to an otherwise patentable species merely because he erroneously thought he was first with the genus when he filed.

Thus, in *Wertheim*, the CCPA held that the specification supported the claimed range, even though the precise range of the claim was not repeated verbatim in the specification. In so holding, the court cautioned that it would “let form triumph over substance” if it allowed the written description requirement to eviscerate claims that are narrowed during prosecution, simply because the patent applicant broadly disclosed in the original patent application, but then narrowed his claims during prosecution.

In view of the above, applicants submit that the present claims are supported by the original disclosure and, accordingly, request withdrawal of this rejection.

Claims 1-2, 5-13 and 15-18 have been rejected under 35 U.S.C. § 102(b) as anticipated by Kanno et al.

In addition, claims 1, 2 and 4-18 have been rejected under 35 U.S.C. § 103(a) as obvious over Kanno et al.

Applicants submit that Kanno et al do not disclose or render obvious the subject matter of the above amended claims and, accordingly, request withdrawal of this rejection.

The present invention as set forth in claim 1 as amended above is directed to a resin composition comprising a resin crystallization promoter comprising vapor-grown carbon fibers,

each fiber filament of the carbon fibers having a diameter of 0.001 μm to 5 μm and an aspect ratio of 5 to 15,000, the fibers having undergone a graphitization at 1,500°C or higher. The resin composition is obtained by kneading the crystallization promoter with an amorphous thermoplastic resin, and subsequently subjecting the resultant mixture to annealing at a temperature under certain conditions. In particular, the annealing is at a temperature of from 55°C higher than the glass transition point of the resin to a temperature 75°C higher than the glass transition point of the resin.

Thus, applicants have amended claim 1 to incorporate the recitations of claims 5 and 6 to recite that the resin is an amorphous thermoplastic resin. Claims 5 and 6 have been canceled. Applicants have also amended claim 8 to direct it to amorphous thermoplastic resins.

According to the present invention, the fibers serve as a resin crystallization promoter by annealing, and as a result crystallization of the amorphous resin can be observed. Promotion of crystallization of the resin enables an improvement in the strength, tribological characteristics and reinforcement effects of the resin composition.

Such effects appear prominently in compositions that contain vapor-grown carbon fibers subjected to a graphitization at 1500°C or higher, e.g., in Example 1 in comparison to Comparative Examples 1 and 3.

Comparative Example 3 shows the results of DSC measurement and X-ray diffraction analysis of a plate sample made of polycarbonate (PC) resin without comprising the above-mentioned vapor-grown carbon fibers, which was subjected to annealing at different temperatures. As stated in Comparative Example 3, a peak attributed to crystallization of the polycarbonate was not observed in any case of the annealing temperature.

Meanwhile, Example 1 and Comparative Example 1 show the results of DSC measurement and X-ray diffraction analysis of plate samples made of polycarbonate comprising the above-mentioned vapor-grown carbon fibers. As stated in Example 1, with respect to test samples subjected to annealing at a specific temperature 200°C ($T_g + 55^\circ\text{C}$) or 220°C ($T_g + 75^\circ\text{C}$), an endothermic peak attributed to melting point was observed at about 200 to 250°C. Further, as stated in Comparative Example 1, with respect to test samples subjected to annealing at specific temperatures of 160°C ($T_g + 15^\circ\text{C}$) and 240°C ($T_g + 95^\circ\text{C}$), which are outside the annealing temperature range of claim 1, a new peak attributed to crystallization of polycarbonate was not observed.

Kanno et al relate to a composite sheet for electromagnetic wave shield comprising a conductive resin layer made of a material wherein vapor-grown carbon fibers are dispersed.

Kanno et al do not disclose or suggest a composition that has been obtained by subjecting the composition to an annealing temperature at an annealing temperature range that is 55°C higher to 75°C higher than the glass transition point of the resin.

Thus, Kanno et al do not disclose or suggest a resin composition comprised of a resin crystallization promoter comprising vapor-grown carbon fibers, wherein the resin composition is obtained by kneading the crystallization promoter with an amorphous thermoplastic resin and subsequently subjecting the resultant composition to the specific annealing temperature range set forth in the present claims. As can be seen from the above discussion of the Examples and Comparative Examples of the present specification, the use of the specific temperature range set forth in the present claims for the annealing results in compositions that have properties that are

not obtained by annealing at the temperatures of Comparative Example 1 outside the claimed range. Kanno et al do not disclose or suggest that the vapor-grown carbon fibers serve as a resin crystallization promoter by heating a resin composition comprising an amorphous thermoplastic resin and vapor-grown carbon fibers at a specific range of temperatures, and do not disclose or suggest that the heating (annealing) of such a resin can improve the strength, tribological characteristics and reinforcement effects of the resin composition.

Thus, Kanno et al do not disclose or suggest the distinguishing effects of the present invention, i.e., by using the vapor grown carbon fiber specified by the present claims at the annealing conditions specified by the present claims, crystallization of the amorphous resin is enabled through the interaction with the fiber, which resin cannot be crystallized by adding a conventional crystallization promoter, and an improvement is obtained of the mechanical strength, fatigue resistance and tribological characteristics of the resin composition by promoting the crystallization rate and crystallization degree of the resin.

In view of the above, applicants submit that Kanno et al do not disclose or render obvious the subject matter of the above amended claims and, accordingly, request withdrawal of this rejection.

Claims 1-3, 5-13 and 15-18 have been provisionally rejected on the grounds of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of copending application 10/553,868.

Since the copending application has not yet been examined, applicants defer responding to this rejection. If the present claims are otherwise found to be allowable, applicants submit that this rejection would then be withdrawn.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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